3: Barrett E-5 (1908-1909)1925
SD 6 Cayapa SD6

A SYSTEM OF MNEMONIC WRITING

802
176
211
[177]

As has already been noted, the Cayapa have no written language and express nothing in writing of any kind. An interesting example of the power of adaptation, however, was given by one individual along this line. The incident, while it has no direct bearing on the general life and culture of the tribe as a whole, may perhaps be significant and of interest when the general subject of mnemonics and hieroglyphic writing is considered, for it shows how readily a single individual of a tribe may borrow a principle which is entirely foreign to the culture of his own people and, with this as a basis, may invent a new system which might give rise to an entirely new order of things if it were carried to its full possibilities. Furthermore, this system is of considerable interest from a phonetic point of view, since it shows that it is founded on strictly phonetic considerations and thus shows what may be termed the natural tendency of the mind of man to correlate and arrange at least some linguistic ideas along logical, phonetic lines.

On the arrival of the author in the Cayapa country he took up his residence with a prominent official of the tribe known, according to the present-day Spanish terminology, as "El Secretario del Gobernacion." When the author expressed a desire to learn the Cayapa language, his host manifested an equal desire to learn English. It was therefore mutually agreed that each should instruct the other. A beginning was made with the numeral system, the author being given the names of the Cayapa numerals. As the terms were pronounced,

3: Barrett E-5 (1908-1909)1925
SD 6 Cayapa SD6

802
176
211

careful record of them was made in writing. However, when the Secretario was told the English numerals, he was entirely dependent on his memory, since no system of writing was known to him. On the following day, when each endeavored to recite his lesson to the other, the Secretario was greatly surprised to hear the author read from his notes and correctly pronounce the Cayapa numerals told him the day before, whereas he, on the other hand, had much difficulty in getting his pronunciation correct and in remembering certain of the English numerals. He asked the author how it was possible to remember these numbers and the pronunciation of them; and upon being told about the aid to the memory given by the writing, he was immediately desirous of trying such a plan himself. Being provided with pencil and paper, he thereupon carefully recorded the first ten of the accompanying set of mnemonic characters (fig. 29). With this paper before him he was able, on the following day, to the author's surprise, to recount with almost perfect exactness these first ten English numerals. A day or two more added another set, and in the course of about a week he had worked out a complete system of mnemonic characters for the numerals from one to one hundred. Furthermore, an interesting feature of this set of mnemonic characters is the fact that they are strictly decimal in their composition, whereas the Cayapa numerals form a much more complex system, it being quinary-decimal-centenary.

The units themselves appear to be entirely unrelated one to another, and as the author watched the Indian making these characters it was evident that a pure proc-

3: Barrett E-5 (1908-1909)1925
SD 6 Cayapa SD6

802
176
211

ess of invention was evolving in his mind, his chief desire being in each instance to get some character that

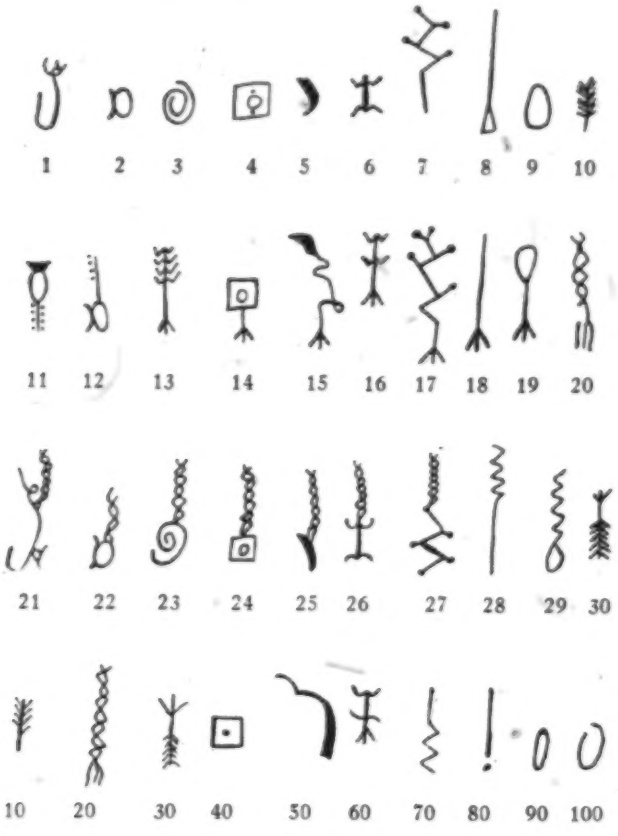

FIG. 29.—Mnemonic characters

should represent the particular number and which should be different from all the others.

In forming most of the characters to represent the

3: Barrett E-5 (1908-1909)1925
SD 6 Cayapa SD6

802 176 ●211

numbers from eleven to nineteen he took carefully into account those representing the units one to nine. In fact, he always referred to these and in most cases reproduced them entirely, or in part, as portions of the characters representing the 'teens. Indeed the characters representing fourteen to nineteen are clearly and obviously these same unit characters with the addition of the crowfoot beneath, which represented to his mind the idea of 'teen—not that it was related to ten, but the crowfoot actually represented to him the sounds comprising 'teen. It is even more evident in thirteen, where the crowfoot first appears but where the unit character for three is not present, that the various parts of these characters actually represented to his mind sounds, rather than precisely correlated ideas of the numeral system. This became clear whenever he used this table of characters, for when he first repeated these numbers he did so very slowly and pointed to the particular part of the character which represented the sound which he was speaking. For instance, in the case of fourteen he would point to the square enclosing the circle and say "four;" then his pencil would go down to the crowfoot and he would say "teen." Likewise in nineteen the oval was nine and the crowfoot 'teen. As still further evidence of the phonetic nature of these mnemonic characters, eleven and twelve are excellent examples. To our minds eleven and twelve belong logically to the set of 'teens, though "'teen" does not appear in them. To the Cayapa's mind, however, the vertical line with the four dots on each side in the sign for eleven represented "e," and the oval with its heavy crescent above

3: Barrett E-5 (1908-1909)1925
SD 6 Cayapa SD6

802
176
211

represented "leven." Likewise, in the case of twelve, the oval with the crescent on the side represented "two," and the vertical line with the four dots on the left represented "helve." Furthermore, he learned this number not as twelve but as "two-helve," and no amount of correction at any later time could change his pronunciation. In both of these instances we have a composition of the character along strictly phonetic lines. In the higher numbers a similar condition prevailed, though in many instances the same sound or set of sounds was represented by different characters. For instance, the "ty" in the higher tens was variously represented. In fifty it was the long heavy curved line, in sixty the crowfoot, and eighty the dot. In each instance this character forms the lower part of these respective characters. In seventy it was the vertical line, and in thirty the crowfoot, which form in these instances the upper part of the character. Forty and ninety are simply four and nine somewhat altered.

As above mentioned, the idea of the addition of ten to the unit in the numbers eleven to nineteen is indicated by joining directly to the characters one to nine certain other characters representing the sounds, not the idea, expressed in "teen." Likewise also in the numbers twenty-one to twenty-nine. The upper part of the character twenty is joined directly to the unit character and forms an integral part of it. From thirty onward, however, a different method was used. Here the unit character was placed directly after the character representing the particular ten which was being used, thus requiring two independent characters instead of one

3: Barrett E-5 (1908-1909)1925
SD 6 Cayapa SD6

802
176
2.11

composite character to represent any particular number. This arrangement of the characters may have been more or less due to the fact that the inventor had seen the English numbers and had had these explained to him. His arrangement of these may possibly have been influenced by the arrangement of the English, and the fact that the lower numbers were not arranged in a similar manner may be because when he invented them he did not thoroughly comprehend this arrangement of the English.

In the accompanying set of these characters it will be observed that in large measure the tens are formed on the units as bases. There are, however, certain exceptions to this rule. For instance, ten, twenty, and thirty are evidently formed independently without taking the numbers one, two, and three into consideration. The remainder of the tens, however, from forty to ninety inclusive, are palpably formed directly from the units four to nine inclusive by the simple addition of some extra stroke or by the alteration of the unit character.

In view of the above-mentioned phonetic nature of this whole system it appears natural that these three numbers, ten, twenty, and thirty, should be different from their corresponding units, since the sounds involved in these three are very different from the sounds involved in the same units. Attention should be called also to the fact that the character thirty strongly resembles thirteen and that to the informant's mind the upper branching portion of the character thirteen represented the portion of this numeral which we pronounce 'thir," while the crowfoot below represented "teen," and that likewise

3: Barrett E-5 (1908-1909)1925
SD 6 Cayapa SD6

the very similar lower portion of the character thirty represented the same sound "thir" while the crowfoot above it represented "ty."

It is therefore evident that, while this set of characters is strictly mnemonic in its use, it is formed on a phonetic basis. It is, as first stated, the original invention of a single individual and in no way represents a tribal characteristic, but with it at hand this individual appeared to be greatly assisted in his difficult task of learning to count in English, and so assiduously did he study his system that in the course of a short time he was able to count fluently from one to one hundred. For a considerable length of time he was unable to do this without the aid of his set of numeral characters, but ultimately, of course, he became so familiar with this that he repeated them easily from memory.